UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/797,262	03/10/2004	Bert C. Lampson	ETSURF-Tirt	6405

41546 7590 01/08/2009

DONNA J. RUSSELL
1492 ANTHONY WAY
MT. JULIET, TN 37122

EXAMINER	
HUTSON, RICHARD G	

ART UNIT	PAPER NUMBER
1652	

NOTIFICATION DATE	DELIVERY MODE
01/08/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

drpatent@comcast.net
dj_russell@comcast.net

Office Action Summary	Application No.	Applicant(s)	
	10/797,262	LAMPSON ET AL.	
	Examiner	Art Unit	
	Richard G. Hutson	1652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 September 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4 and 10-14* is/are pending in the application.

4a) Of the above claim(s) *5-9,15 and 16* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4 and 10-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Applicant's amendment of claim 1, in the paper of 9/14/2008, is acknowledged. Claims 1-16 are still at issue and are present for examination. Applicants' arguments filed on 9/14/2008, have been fully considered and are deemed to be persuasive to overcome some of the rejections previously applied. Rejections and/or objections not reiterated from previous office actions are hereby withdrawn.

Claims 5-9, 15 and 16 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention, the requirement having been traversed in the paper of 10/17/2006.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-4 and 10-14 remain rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As previously stated, claim 1 (claims 2-4 and 10-14 dependent on) is indefinite in that the recitation "group II intron-type reverse transcriptase" is unclear and confusing. As this limitation of the claims is confusing and unclear, it is not considered to limit the claims beyond that the claimed polypeptide must be a reverse transcriptase.

Applicants traverse this rejection on the basis that this is a term of art and to those of skill it describes a type of reverse transcriptase that is derived from a group II

intron. Applicants additionally provide five references to support applicant's position that the term is understood by those of skill in the art. Applicants submit that they believe that the use of the term is and was widespread enough that there is no doubt as to what the term is intended to describe and define.

Applicants complete argument is acknowledged as are the references cited by applicant in asserting there position, however, applicants argument is not found persuasive for the reasons previously made of record.

Applicants are reminded that the recitation "group II intron-type reverse transcriptase" is unclear as applicants nor the art distinguish this term from other non-group II intron type reverse transcriptases. Applicant's presentation of the cited references is acknowledged and appreciated for describing various characteristics of group II introns (i.e. the presence of various domains etc…) as well as reverse transcriptases encoded by group II introns. In spite of the references presented by applicants it remains unclear as to the difference between a reverse transcriptase that is considered a group II intron-type reverse transcriptase and a reverse transcriptase that is a non-group II intron-type reverse transcriptase.

Applicants presentation of applicants specification at page 8, lines 19-28 is also acknowledged, and while applicants attempt to differentiate between group II introns and a retron is acknowledged, this is not sufficient to alleviate the confusion between group II-type reverse transcriptases and reverse transcriptases that are non-group II type.

Thus it is continues that the recitation "group II intron-type reverse transcriptase" is interpreted as merely describing any reverse transcriptase.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-4 and 10-14 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

This rejection was stated in the previous office action as it applied to previous claims 1-4 and 10-14. In response to this rejection applicants have amended claim 1 and argue the rejection as it applies to the newly amended claim.

Applicants traverse the rejection together with the rejection below based upon lack of enablement on the basis that they submit that they demonstrate in the specification and in the drawings, there is significant variability between the reverse transcriptases derived from various bacteria, yet they retain their RT activity and that given the information provided, it is clear to someone of skill in the art that amino acid substitutions may be made in particular regions of the protein without affecting its RT activity. Applicants submit that furthermore given the availability of gene-synthesis and peptide/protein-synthesis services, while it might take additional funds to identify catalytically-active mutants, it would not take undue effort.

Applicants submit that in the present situation, the inventors have identified a specific sequence that encodes a group II intron reverse transcriptase, and have demonstrated that it shares certain sequence similarities with other bacterial RTs. Applicants submit that they have also demonstrated that there is considerable genetic and peptide variability that is tolerated in the sequences of the RTs and those of skill in the art are individuals with expertise in recombinant DNA techniques and expertise in designing proteins based on existing sequences. Applicants respectfully submit that both the written description and the enablement requirements have therefore been met by the present disclosure and that it is commensurate with the breadth of the claims.

Applicant's amendment of the claims and applicants complete traversal is acknowledged and has been carefully considered, however, is found non-persuasive for the reasons previously made of record and for those reasons repeated herein.

As acknowledged by applicants, there is significant variability between the reverse transcriptases derived from various bacteria, and while amino acid substitutions may be made in particular regions of the protein without affecting its RT activity, applicants have not described those regions or the specifics of the referred to amino acid substitutions.

As such applicants have described a single reverse transcriptase encompassed by the claimed genus, (i.e. SEQ ID NO:2) of reverse transcriptases.

There is no disclosure of any particular structure to function/activity relationship in the single disclosed species beyond its amino acid sequence. Given this lack of

additional representative species as encompassed by the claims, Applicants have failed to sufficiently describe the claimed invention, in such full, clear, concise, and exact terms that a skilled artisan would recognize Applicants were in possession of the claimed invention.

Applicant is referred to the revised guidelines concerning compliance with the written description requirement of U.S.C. 112, first paragraph, published in the Official Gazette and also available at www.uspto.gov.

Claims 1-4 and 10-14 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a reverse transcriptase comprising the amino acid sequence of SEQ ID NO:2, does not reasonably provide enablement for any polypeptide variants of SEQ ID NO: 2 having a mere 80% identity to SEQ ID NO: 2 and having a similar reverse transcriptase activity or any catalytically active deletion mutant of SEQ ID NO: 2. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

This rejection was stated in the previous office action as it applied to previous claims 1-4 and 10-14. In response to this rejection applicants have amended claim 1 and argue the rejection as it applies to the newly amended claim.

Applicants traverse the rejection together with the rejection above based upon lack of description on the basis that they submit that they demonstrate in the specification and in the drawings, there is significant variability between the reverse

transcriptases derived from various bacteria, yet they retain their RT activity and that given the information provided, it is clear to someone of skill in the art that amino acid substitutions may be made in particular regions of the protein without affecting its RT activity. Applicants submit that furthermore given the availability of gene-synthesis and peptide/protein-synthesis services, while it might take additional funds to identify catalytically-active mutants, it would not take undue effort.

Applicants submit that among the Wands factors is the consideration as to the amount of guidance presented, the nature of the invention, the relative skill of those in the art, and the predictability or unpredictability of the art. Applicants submit that in the present situation, the inventors have identified a specific sequence that encodes a group II intron reverse transcriptase, and have demonstrated that it shares certain sequence similarities with other bacterial RTs. Applicants submit that they have also demonstrated that there is considerable genetic and peptide variability that is tolerated in the sequences of the RTs and those of skill in the art are individuals with expertise in recombinant DNA techniques and expertise in designing proteins based on existing sequences. Applicants respectfully submit that both the written description and the enablement requirements have therefore been met by the present disclosure and that it is commensurate with the breadth of the claims.

Applicant's amendment of the claims and applicants complete traversal is acknowledged and has been carefully considered, however, is found non-persuasive for the reasons previously made of record and for those reasons repeated herein.

As acknowledged by applicants, there is significant variability between the reverse transcriptases derived from various bacteria, and while amino acid substitutions may be made in particular regions of the protein without affecting its RT activity, applicants have not described those regions or the specifics of the referred to amino acid substitutions.

As such applicants have described a single reverse transcriptase encompassed by the claimed genus, (i.e. that of SEQ ID NO:2) of reverse transcriptases.

While methods to produce variants of a known sequence such as site-specific mutagenesis, random mutagenesis, etc. are well known to the skilled artisan producing variants as claimed by applicants (i.e., having reverse transcriptase activity) requires that one of ordinary skill in the art know or be provided with guidance for the selection of which of the infinite number of variants have the claimed property. Without such guidance one of ordinary skill would be reduced to the necessity of producing and testing all of the virtually infinite possibilities. This would clearly constitute undue experimentation. While enablement is not precluded by the necessity for routine screening, if a large amount of screening is required, the specification must provide a reasonable amount of guidance with respect to the direction in which the experimentation should proceed. Such guidance has not been provided in the instant specification. As previously stated the specification does not establish: (A) regions of the protein structure which may be modified without effecting the desired or reverse transcriptase activity; (B) the general tolerance of reverse transcriptases to modification and extent of such tolerance; (C) a rational and predictable scheme for modifying any

amino acid residue of a reverse transcriptase with an expectation of obtaining the desired biological function; and (D) the specification provides insufficient guidance as to which of the essentially infinite possible choices is likely to be successful. Because of this lack of guidance, the extended experimentation that would be required to determine which substitutions would be acceptable to retain the desired or reverse transcriptase activity claimed and the fact that the relationship between the sequence of a peptide and its tertiary structure (i.e. its activity) are not well understood and are not predictable, it would require undue experimentation for one skilled in the art to arrive at the majority of those polypeptides of the claimed genus having the claimed desired or reverse transcriptase activity.

Thus, applicants have not provided sufficient guidance to enable one of ordinary skill in the art to make and use the claimed invention in a manner reasonably correlated with the scope of the claims broadly including any number of amino acid modifications of any reverse transcriptase of SEQ ID NO: 2. The scope of the claims must bear a reasonable correlation with the scope of enablement (In re Fisher, 166 USPQ 19 24 (CCPA 1970)). Without sufficient guidance, determination of those polypeptides having the desired biological characteristics is unpredictable and the experimentation left to those skilled in the art is unnecessarily, and improperly, extensive and undue. See In re Wands 858 F.2d 731, 8 USPQ2nd 1400 (Fed. Cir, 1988).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Gu et al. (U.S. Patent No. 7,094,539).

As previously stated, Gu et al. teach a composition comprising an isolated *Bacillus Stearothermophilus* reverse transcriptase, which anticipates claim 1 drawn to an isolated *Geobacillus stearothermophilus* reverse transcriptase. The *Bacillus Stearothermophilus* reverse transcriptase taught by Gu et al. is considered a group II intron-type reverse transcriptase absent a clear definition to the contrary as to what a group II intron-type reverse transcriptase is (See above rejection under 112 second paragraph).

Applicants traverse this rejection on the basis that as discussed above a "group II intron-type reverse transcriptase" is a term of art known to those of skill in the art and among the differences between the composition taught by Gu et al. and the composition

of the present invention, the reverse transcriptase taught by Gu et al. lacks a maturase region ("X" domain) Applicants further submit that Gu et al. describes a DNA polymerase not the present invention, a RNA polymerase.

Applicants amendment of the claims and applicants complete argument are acknowledged, however, not found persuasive for the reasons previously made of record. As stated previously, absent a clear definition of group II intron-type reverse transcriptase, it remains that the reverse transcriptase taught by Gu et al. is considered to be a group II intron-type reverse transcriptase. Further while the protein taught by Gu et al. has DNA polymerase activity, it also has RNA polymerase activity and applicant's argument based upon such is not found persuasive. Thus Gu et al. continues to anticipate the claimed reverse transcriptase.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard G. Hutson whose telephone number is 571-272-0930. The examiner can normally be reached on M-F, 7:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nashaat T. Nashed can be reached on 571-272-0934. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

rgh
1/3/2009

/Richard G Hutson, Ph.D./
Primary Examiner, Art Unit 1652